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JSC contractors win Low Award for quality

JSC aircraft operations contractor DynCorp and space suit contractor ILC Dover Inc., are two of five aerospace companies awarded the space agency's highest honor for excellence and quality this month.

NASA Administrator Daniel S. Goldin presented the 1998 George M. Low Award to the companies at the 13th annual NASA Continual Improvement and Reinvention Conference on Quality Management in Alexandria, Va. The award, established in 1985, is NASA's

highest quality and excellence award for contractors and subcontractors and the oldest award for organizational quality.

"These companies exemplify excellence and outstanding achievements that prove beneficial to NASA and the nation's industry," Goldin said.

DynCorp supports a wide array of aircraft equipment and systems at Ellington Field, and the success of NASA's astronaut training program and shuttle mission support pro-

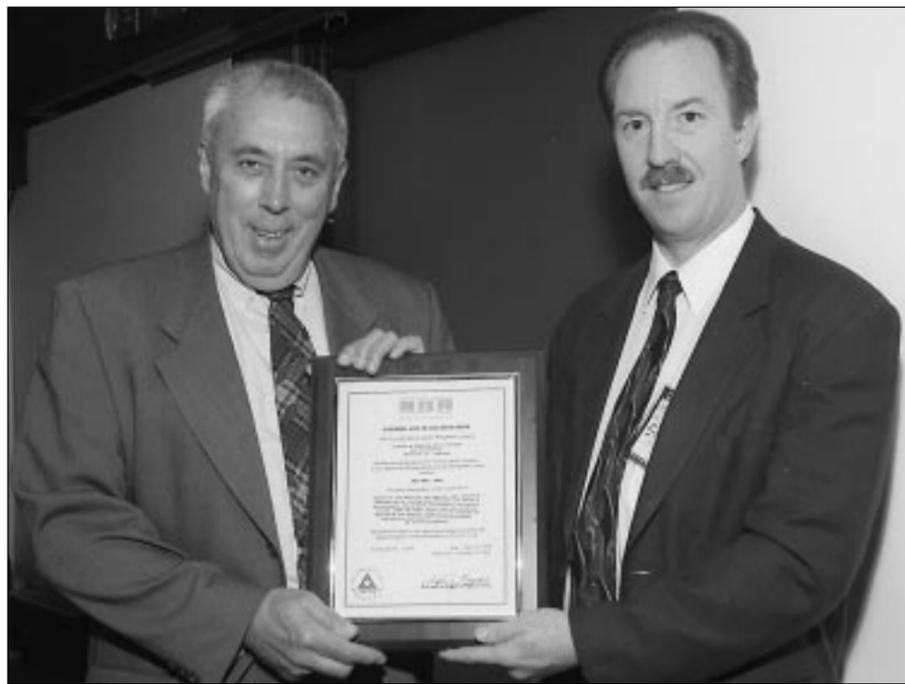
grams are directly related to its performance.

ILC Dover specializes in developing high-technology engineered soft-goods, and has a long record of outstanding performance in the development of EVA space suits, with a field group at JSC supporting them.

"Johnson Space Center is extremely proud to have such hard working and quality-conscious partners," said JSC Director George Abbey. "The work DynCorp does is

critical to the training of our astronauts and the safe, efficient operation of JSC's varied aircraft fleet. ILC Dover's work at JSC gives space walking astronauts the security and flexibility to do construction work in space that will become even more critical as we begin to build the International Space Station. I congratulate both DynCorp and ILC Dover on this well-deserved honor."

DynCorp's Johnson Support Division and Allied Signal Technical Please see **NATIONAL**, Page 8



JSC Photo S98-06855 by Steve Candler

Kevin Beard, lead auditor for the National Quality Assurance USA, presents the Certificate of Registration to JSC Director George Abbey at a May 13 ceremony recognizing JSC as the first NASA field center to earn ISO 9001 certification.

JSC earns ISO 9001 certificate

JSC is the first NASA field center to earn ISO 9001 certification and one of the largest U.S. research and development organizations so honored.

National Quality Assurance USA presented the certificate of ISO 9001 registration to JSC Director George Abbey on May 13. The presentation followed a successful independent audit by NQA of the JSC Quality System in late February.

The third-party auditors examined such areas as management commitment, design control, documentation, purchasing, test and inspection, and corrective action procedures. NQA found that JSC met or exceeded the stringent quality standards in all areas.

"This certification is a significant testimonial to the excellence of our quality system at JSC, and also serves as a starting point for continuing improvement of our overall technical and management processes," Abbey said.

ISO 9001 comprises the most detailed, comprehensive set of standard requirements for quality programs established by the International Standards Organization. To date, nearly 20,000 U.S. organizations have received ISO 9001 certification.

All NASA centers are required by NASA Administrator Daniel S. Goldin to be ISO 9001 registered by September 1999. NASA is the first federal agency to seek the quality certification.

JSC's certification applies to all center human space flight responsibilities, including program and project management, spacecraft engineering and design, flight crew training, space and life sciences research, and mission operations in support of NASA's Human Exploration and Development of Space enterprise.

JSC began with a project program in its Safety, Reliability and Quality Assurance directorate in 1995. In 1996, White Sands Test Facility received its ISO registration. ISO requirements became JSC's official quality program for the entire center in May 1997.

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Barrios, Johnson Engineering earn kudos

Pair earns Small Business Contractor of Year awards

Barrios Technology, Inc. and Johnson Engineering Corp. recently were selected as JSC's 1998 Small Business Contractor of the Year by JSC Director George Abbey.

The distinguished awards were presented by Business Management Director Jim Shannon to Sandy Johnson, president of Barrios Technology, and Tom Short, president of Johnson Engineering, at the Government Procurement Connection '98 awards and appreciation luncheon at the George R. Brown Convention Center in Houston.

"The work performed by these two contrac-

tors has been exemplary," Abbey said. "They have proven to be key players in this center's operation and management of the agency's human space flight programs. Their work has been instrumental in the Space Shuttle Program and will be crucial to the success of the International Space Station Program. Congratulations to both Barrios and Johnson Engineering on earning these well-deserved honors."

Barrios was selected for its outstanding effort in providing Information Systems Analysis and

Please see **TWO**, Page 8

Discovery launch marks start of new space era

By John Ira Petty

With a new launch date and a new, super-lightweight external tank, the Space Shuttle *Discovery* moved closer to its 24th flight, the ninth and final docking with the Russian Space Station Mir. The mission will complete Phase 1 of the International Space Station Program.

Shuttle managers were set to meet Wednesday to review mission preparations and set an official launch date. The launch target date has been moved to June 2, providing additional time to accommodate orbiter processing and launch preparations at Pad 39A.

The new super lightweight external

tank weighs about 7,500 pounds less than the original. The tank arrived at Kennedy Space Center's turning basin in early February for testing and pre-launch processing and underwent a tanking test on Monday.

STS-91 Commander Charlie Precourt will be making his fourth space flight. Pilot Dom Gorie will make his first flight; Mission Specialist Wendy Lawrence her fourth flight; Mission Specialist Franklin Chang-Díaz, his sixth flight; and Mission Specialist Janet Kavandi her first flight. Russian Valery Ryumin will be making his fourth space flight, his first as a mission specialist.

Please see **STS-91**, Page 2



JSC Photo STS-90-S-014 by Hector Gongora

SIGN HERE—STS-90 Payload Specialist Jim Pawelczyk shakes hands with students from Westwood Elementary School. Hundreds of third and fourth graders from the Friendswood school who adopted the Neurolab mission in their studies joined the Neurolab crew's friends, family members and coworkers in welcoming them home on May 4 at Ellington Field's Hangar 990.

Thomas close enough to end to begin looking back

Andy Thomas is close enough to the planned end of his stay aboard the Russian space station Mir to begin to look back a little. All in all, he's pleased with what he sees.

"From a personal point of view, yes, I'm satisfied with the outcome," Thomas said. "We came up here with a fairly ambitious science program, which was primarily my responsibility during the mission, and that's been completed."

He said his fellow crew members, Commander Talgat Musabayev and Flight Engineer Nikolai Budarin, had some very ambitious space walk work, to straighten up a bent solar array and replace an engine. "They've achieved that; they've worked very hard on these tasks. So I think all in all, a great deal has been accomplished."

Thomas said he believes his mission has been a help to both Russia and the United

States in preparing for Phase 2 of the International Space Station program, assembly of the multinational research outpost.

"The whole effort has been one of learning how to work in a spirit of cooperation," he said. Even during his training in Russia, one focus was learning how to work together to achieve the training goals. Aboard Mir, "We've learned how to work together here on board."

Thomas has gained a lot of personal insights on long-duration space flight—"what's the best way to live on board; what's the best way to package food; what's the best way to do day-to-day housekeeping; what's the best way to live in a confined space for an extended period of time," and more.

In the midst of an extended period of packing up, Thomas had another loading and unloading job to help with. The Mir crew finished loading refuse in the Progress M-38 resupply ship linked to the Mir and prepared for the arrival of the Progress M-40 resupply ship, launched May 14 from the Baikonur Cosmodrome to carry food, water and supplies to Mir.

The previous Progress undocked May 15 to begin moving toward its destruction in the Earth's atmosphere.

Thomas continued to monitor large fires in Honduras and the Yucatan Peninsula. Thomas has been photographing Earth surface changes throughout his stay on orbit. Last week he was able to photograph the eruption of

Costa Rica's Arenal volcano.

Thomas' scientific experiments continue as he nears the end of his more than four months in orbit. They comprise 27 separate studies in advanced technology, Earth sciences, human life sciences, microgravity research, and International Space Station risk mitigation.

Earlier this month, Thomas completed the second of three phases of the Renal Stone Risk Assessment experiment. The final phase will be completed just prior to Thomas' return to Earth.

Thomas has less than three weeks left aboard the Mir Space Station. In early June, *Discovery* will dock with Mir and bring Thomas home to complete almost 1,000 days of U.S. astronaut occupancy aboard the station, including more than 26 months of continuous time on orbit.



'Launch Break' to feature more camera shots

JSC employees are encouraged to take another "Launch Break" for the upcoming STS-91 mission, participating in an officially recognized voluntary pause in the workday to watch the launch.

While the pause is voluntary, JSC managers are encouraged to provide breaks in meetings and other non-critical activities. Center organizations are asked to allow access to conference rooms and other locations with NASA Television.

A primary location for observing the launch will be Teague Auditorium, where the countdown and ascent will be shown on the large screen. A speaker from the Flight Director Office will provide in-person commentary during the launch and respond to questions afterward. For the first time, additional technical shots used for analysis by the mission evaluation room at KSC will be projected on a second screen, and a separate audio feed from the launch pad will be heard.

STS-91 launch is tentatively scheduled for 5:10 p.m. CDT June 2. Call the Employee Information Service at x36765 for the latest information or check the Daily Cyber Space Roundup at <http://www.jsc.nasa.gov/pao/roundup/>



NASA Photo KSC-98PC-0593

The STS-91 flight crew poses for a group portrait in the white room on the Orbiter Access Arm at Launch Complex 39A during Terminal Countdown Demonstration Test activities. From left, they are (back row) Pilot Dom Gorie; Mission Specialist Wendy Lawrence and Commander Charlie Precourt; and (front row) Mission Specialists Franklin Chang-Diaz, Valery Ryumin, with the Russian Space Agency; and Janet Kavandi.

Mission Operations makes adjustments among key managers

JSC's Missions Operations Directorate has made a number of key personnel changes that are effective immediately.

Lee Briscoe has been appointed the directorate's chief engineer. Following several co-op tours, Briscoe joined JSC in 1965 after graduating from Texas A&M University with a degree in industrial engineering. Since then, he has held progressively responsible positions in Mission Operations and the Space Shuttle Program, including flight director; deputy manager of space shuttle operations; and most recently chief of the Flight Director Office.

Jeff Bantle has been selected to replace Briscoe as the chief of the Flight Director Office. Since joining JSC in 1984, Bantle has held progressively responsible positions in Mission Operations, including section head in the Systems Division and most recently deputy, Flight Director Office. He holds a bachelor's degree in mathematics/physics from Ripon College and a master's degree in aeronautics from George Washington University.

Milt Heflin has been named deputy chief of the Flight Director Office, replacing Bantle. Heflin's most recent assignment has been as deputy manager of the EVA Project Office. During his career with NASA, Heflin has served in numerous key positions, including recovery engineer during the Apollo, Skylab, and Apollo-Soyuz missions, flight controller and flight director for 20 shuttle flights. Heflin joined JSC in 1966, after earning a bachelor's degree in physics and mathematics from the University of Central Oklahoma.

Jack Knight has been selected as chief of the Simulator Operations and Technology Division, replacing Bob Holkan, who is retiring. Most recently, Knight was Mission Operations' chief engineer. His career with NASA began in 1965 after earning a bachelor's degree in electrical engineering from Georgia Tech. He has held progressively responsible positions in the Systems Division, including section head, branch chief, technical assistant for systems integration, deputy division chief and division chief. He also was a flight controller.

STS-91 features search for anti-matter with powerful spectrometer

(Continued from Page 1)

Precourt, an Air Force colonel, has made two previous visits to Mir. This flight, he said signals "the end of one era and the beginning of another," the Phase 2, assembly, phase of the international research outpost.

For the return trip from Mir, they will be joined by Andy Thomas, who arrived on Mir with STS-89, launched Jan. 15.

The Phase 1 Program has maintaining a continuous American presence in space and developing the

procedures and hardware required for an international partnership in orbit. The program has produced priceless lessons, not only in long-duration space flight, but in the kind of international cooperation that will be required for the International Space Station.

Discovery also will carry the Alpha Magnetic Spectrometer investigation into space. The objectives are to search for anti-matter and dark matter in space and to study astrophysics. The investigation

makes up about half of the mission, scheduled for 10 days.

"It's the first high-energy particle physics experiment to fly on the space shuttle," Lead Flight Director Paul Dye said. "The AMS is not really designed to fly on the shuttle—it's designed to fly on the space station."

It will remain on the ISS for several years. "The flight on STS-91 is a chance for the scientists to check out the hardware, to check out their operations, see how the concept works and see what they can learn

about working in space," Dye said.

The multi-national AMS is operated largely by ground command. It is basically a large magnet that can bend and record the path of high-energy particles. Potentially, AMS can detect particles that can't be seen inside the Earth's atmosphere. AMS data will be recorded on board, and the crew can back up ground control if there is a command problem.

Several other experiments will be aboard *Discovery*, include two Get-

away Specials. The shuttle's robotic arm also will be tested with its new station-related equipment. The shuttle also will release a tracer gas into Mir's damaged Spektr module to try to pinpoint a leak. A single Spacehab module will be carried in *Discovery's* cargo bay.

The June 2 launch is scheduled for 5:09 p.m. CDT. The launch window, typically of flights to Mir, is short—seven to 10 minutes. The landing is set for the afternoon of June 12.

Model railroad firm leaps into space age

By John Ira Petty

When Frank Angstead took an accounting job at the InterMountain Railway Co. in Longmont, Colo., 10 years ago, he hadn't given a lot of thought to the International Space Station. He thinks about it a lot now. So does his son, Ron.

The company makes model railway cars using injected plastic molding. Now they're moving into the space age, with a remarkably accurate and detailed 1:1/44 scale model of the station.

They exhibited the model in the lobby of the Teague Auditorium during the International Space Station Workshop for news media representatives May 12-14.

The display model was about 95 percent complete. It lacked only the Canadian arm, the service module (for which a control module was substituted) and a number of tiny detail parts. The finished version will be made up of about 300 parts.

"In some respects," said Ron Angstead, "you can achieve more detail in plastic injection than working by hand." CNC (computer numerically controlled) devices can produce tooling for detail as fine as .003 of an inch in that application, he said.

Both Frank and Ron Angstead, who joined the company as a production worker nine years ago and is now a vice president, are principals in the company. Its founder, toolmaker Fred Brummett, also remains a principal. Sales have grown from \$96,000 in 1989 to about \$1.2 million today.

The company's focus remains model railroad cars, in various scales and from various eras. But Frank Angstead said they see a lot of potential in the station model, which will be available soon, and models of other spacecraft that could follow.

The company got into the space model business unexpectedly. About three years ago Johnson Engineering asked if InterMountain would consider

making a station model.

Discussions continued off and on until about 18 months ago, when Johnson Engineering called to say it was ready to proceed. That company provided detailed drawings of the station, and work on the molds began.

InterMountain Railway will offer the ISS model in three versions. Museum-grade models will be completely assembled and offer great detail. The primary market will be aerospace companies. Those models will sell for between \$1,000 to \$2,000. Models for education will be partly assembled, and offer less detail. Including lesson plans, they will sell for about \$600. Kit models will be as detailed as the museum quality models, but require assembly—perhaps 10-15 hours. They'll cost \$150-\$160.

"Key to the model's success is that it will be more robust, cost less and offer more detail than hand-made models," said Frank Angstead, InterMountain's chief executive officer.



NASA Photo by Steve Candler

Frank and Ron Angstead display a museum-grade model of the International Space Station, made using computer numerically controlled injected plastic molding. The company doesn't plan to stop with the station models. It is developing plans for detailed models of the X-33 and X-38 spacecraft.

Community News

Outreach volunteer urges all employees to carry NASA story back home

Proving that the saying "You can't go home again" is off the mark, JSC's Extravehicular Mobility Unit Laboratory manager recently returned to his hometown of Columbia, S.C., to share the wonder and excitement of his job with today's students.

Johnny Sanders, who works for JSC space suit prime contractor Hamilton Standard in supporting Engineering's Crew and Thermal Systems Division, went back to his old school, Lyon Street Elementary, in March for a follow-up visit with the current fifth-grade class. Teacher Betty Mack, who helped Sanders on two previous visits, had shared the students' request that he return to the school he graduated from in 1965.

The return visit was prompted both by the students' interest in his vocation and by a promise made in 1996 that he would return to talk about NASA and bring space candy if they stayed in school. When Sanders returned, he took with him 30 bags of space candy purchased at Space Center Houston.

"The support by JSC, CTSD, and Hamilton Standard has brought NASA into the world of these young people," Sanders said. "All space employees should go back, to your birth home and bring NASA to town. The small light that shines on JSC and contractor personnel is a big glow in your hometown."

Sanders said he began his

morning with a live closed-circuit television feed to the entire school, with students directing and performing anchor desk reporting functions. Joined by his wife, Barbara, who works for United Space Alliance and was making her first education outreach visit, Sanders presented an autographed picture of Astronaut Winston Scott to the school on behalf of all JSC employees

Following that, he shared an educational videotape about "Camping in Space," because "the content is excellent for child development classes aimed at children 4 years old and below," as are NASA highlight tapes and the "Andy the Astronaut" video.

The culmination of the visit was an opportunity for the fifth graders (and their teachers) to don a space suit, helmet and gloves.

Although the students at Lyon Street had written letters asking if an astronaut could come to their school, there was none available on that date. However, former Astronaut Charlie Bolden's, mother Mrs. Charles Bolden Sr., who lives in the area, helped fulfill the request.

Following his visit to the elementary school, Sanders said he spent the next day at C.A. Johnson High School for an off-the-cuff talk with retired Air Force Col. Charles Watson's R.O.T.C. class. Astronaut John Young wore a high altitude suit originally designed for Watson's use in the SR-71 "Blackbird" on STS-1, Sanders said.



Above: Teacher Betty Mack and fifth-grade students at Lyon Street Elementary School in Columbia, S.C., try out some space hardware during a visit by alumnus Johnny Sanders, now Hamilton Standard's manager of the JSC Extravehicular Mobility Unit Laboratory. Below, Sanders and his wife, Barbara, a United Space Alliance employee, show some of the space equipment they shared with the students.



Oceaneering expands in Clear Lake

NASA contractor Oceaneering International Inc. recently announced an expansion and reorganization resulting from the addition of contracts for commercial launch vehicle thermal protection.

Art Stephenson is the new president of Oceaneering Advanced Technologies. Formerly vice president and general manager of Oceaneering Space Systems in Clear Lake, Stephenson now oversees three divisions that comprise Advanced Technologies: Oceaneering Space Systems, Oceaneering Thermal Systems and Oceaneering Technologies. The space and thermal systems divisions are based in Clear Lake, which the technologies division, which supports the U.S. Navy, Department of Energy and the entertainment industry, is based in Maryland.



Stephenson

Mark Gittleman is the newly appointed vice president and general manager of Oceaneering Space Systems.

Ron Welch is vice president and general manager of Oceaneering Thermal Systems, which recently separated from the space systems division as a stand-alone business to address significant expansion. The thermal division is on contract in Clear Lake to provide insulation products to protect launch vehicles such as the Atlas, Delta, Titan, X-34 and Kistler K-1 from overheating. To handle the expansion, Oceaneering recently leased an additional 7,000 square feet in Webster for manufacturing to augment its 55,000 square foot building on Space Center Blvd.

"We are very pleased with the added contract we have received in our commercial launch vehicle thermal protection business," Stephenson said. "Oceaneering is committed to continue our strong support of NASA and NASA's contractors in development of extravehicular activity tools for astronauts, robotics, life support and specialized equipment for human space flight such as refrigerator/freezers for shuttle and space station."

McKay to keynote AIAA's annual Technical Symposium

The Houston Section of the American Institute of Aeronautics and Astronautics will host its annual Technical Symposium from 8 a.m.-5 p.m. May 28 at Space Center Houston.

This year's theme will be "Technologies for the 21st Century," and more than 50 speakers and six technical sessions are planned.

The keynote speaker will be the internationally recognized planetary scientist Dr. David McKay, of JSC's Space and Life Sciences Directorate, who will provide an update on

the "Evidence for Life on the Planet Mars." Dr. Ken Cox, assistant to the JSC Engineering Director, will present "A Futurist Perspective for Space" at 3:30 p.m.

Participants may register early or at the entrance to Space Center Houston the day of the conference.

Sessions will include: "International Space Station: The Next Logical Step," "Space Shuttle: Better, Faster, Cheaper," "Earth Science Remote Sensing—New Opportunities with the ISS," "The Earth Science Enterprise," "New

Technologies for New Environments: Systems Engineering, Robotics," "Space & Life Sciences: Humans in Space," and "The Red Planet: Mars or Bust!"

Each attendee will subsequently receive a CD-ROM with a copy of all symposium presentations and related information.

Cost for the whole day, including lunch, is \$25 for members, \$35 for non-members. Cost for a half day is \$20 for members, \$25 for non-members. Space Center Houston parking is free for participants. JSC civil ser-

vants may show their NASA badges at the AIAA registration booth for complimentary admission; the cost will be covered by subsequent voucher through the JSC Human Resources Office.

More information and electronic registration are available on the Internet at: <http://www.jsc.nasa.gov/aiaa/> or contact Edward Jablonski, AIAA JSC ATS '98 general chairman, at 336-4294.

To register by phone, call Janet Stewart at 333-6724 or Miros Garza at x30934.

JSC Safety Alert

Keep Your Modifications Safe, and Watch Your Step

What Happened

On April 8, 1998, a JSC employee walked between two computer equipment cabinets and stepped into an uncovered cable access opening (approximately 8 inches by 10 inches). The employee fell, suffering injuries to the right shin, knee, leg, and hip that resulted in a Lost Time Incident. A more serious injury could have resulted—a broken leg, knee, or hip.

Results of the Investigation

The space between the two computer equipment cabinets was created when another computer equipment cabinet was removed. As a result, an uncovered cable access opening in the floor was exposed. An orange cone was placed beside the opening but was later removed. Although the area is well illuminated, the black-bordered access, together with the dark underfloor, created the illusion that the opening was covered.

What You Can Do

When building or modifying equipment, facilities, or systems, ensure that you do not create any hazards for area occupants during your work activities, prior to leaving the area, or prior to releasing the work area back to the area's occupants. When working in floor holes or openings, use one (or a combination) of the following safety measures to ensure that area personnel are not exposed to tripping or falling hazards: constantly guard (standby and monitor) the work area while you are performing your work; cover floor holes or openings that are not being constantly guarded; install a barrier system (not just a cone) that reliably prevents area occupants from inadvertently entering the areas adjacent to holes or openings that are not constantly guarded; or close access to the entire work area to prevent occupants' entrance into work sites where holes or openings are not constantly guarded. Even if you are familiar with an area, be aware that it can change or be modified quickly. Always be aware of the potential for fall and trip hazards. In unfamiliar areas, take extra precautions against hazards.

Give the 'Gift of Life'

Next Onsite Blood Drive at JSC coming up June 2-3

The next JSC Onsite Blood Drive is set for June 2 and 3 and employees are encouraged to give the gift of life.

Employees wishing to donate blood may visit the Teague Auditorium lobby anytime between 7:30 a.m. and 4:30 p.m., including lunch time. Appointments are only necessary if employees plan on donating platelets or plasma but no appointments are necessary for whole blood donations.

For those who have never donated blood, the process is pretty simple. It starts with a blood sample. Afterwards, one pint of blood is drawn. Drawing whole blood takes seven to 10 minutes, with the overall process usually taking around 45 minutes including screening. The donated blood undergoes several tests, including the tests for hepatitis and HIV. If there are positive test results donors are notified by mail. All results are kept confidential. Usually there are no negative reactions to giving blood, but trained

personnel are always available in case a donor becomes light-headed.

Generally, donors can give blood every eight weeks. In some cases, a donor may be deferred if, for example, their blood is low in iron or they've been on certain medications. If prospective donors have questions, about how a medical condition may affect their ability to give blood, they may call St. Luke's Blood Donor Center at 791-4483.

Under the St. Luke's agreement, with NASA and contractors, the hospital provides blood assurance coverage for all JSC personnel and their immediate families. Coverage includes all fees associated with blood products for blood transfused in any Houston area hospital. Immediate family is considered to be the spouse of an employee, any dependent children and parents of an employee and spouse.

For more information about the JSC on-site blood drive, call Amy Mendez at x32604.



S90-S-017



S90-S-016

1 JSC Director George Abbey and the STS-90 crew, from left Payload Specialist Jay Buckley and Jim Pawelczyk, Payload Commander Rick Searfoss, Commander Rick Linnehan, Mission Specialist Kay Hire and Dave Williams and Pilot Scott Altman, recite the pledge of allegiance with students from Westwood Elementary School, who adopted the Neurolab mission in their studies.

2 Westwood Elementary students pledge allegiance with the STS-90 crew and their friends, family and coworkers in Hangar 990 at Ellington Field.

3 Payload Specialist Jim Pawelczyk checks out a banner displayed at the homecoming ceremonies. The banner features cartoon characters "Pinky and the Brain" and a "Cranial Crusaders" logo in honor of the mission's research in to how the human brain and nervous system adapt to weightlessness. Several of the crew members sported temporary tattoos with the logo during the mission.

4 Payload Specialist Jim Buckley signs autographs for coworkers and children alike following the speeches at Ellington.



S90-S-012



S90-S-013

Science *on the* Edge

Neurolab crew saw faces of support team whenever they broke out piece of equipment

By John Ira Petty

The seven STS-90 crew members were all smiles on their return to Ellington Field after the lengthy and demanding Neurolab flight, and full of gratitude to the many people who had helped make the mission a success.

"What an experience," said Columbia Commander Rick Searfoss.

JSC Director George Abbey began the May 4 ceremonies by welcoming the crowd, the crew and Westwood Elementary School students with their choir.

The Harmony Singers, 30 fourth graders from the Friendswood school that had "adopted" the STS-90 during the astronauts' training period, sang the National Anthem and two other songs inside Hangar 990 before Abbey turned the microphone over to Searfoss.

Searfoss praised his fellow crew members, saying they were world-class in their fields technically, great human beings, hard workers in sometimes trying situations. They also were "pleasant and fun to be around.... We were having a good time up there."

Searfoss had told the crew early in the flight that a gauge of how they were doing was whether they were having fun. "I think we maxed out that gauge and ... the science return and the overall mission objectives we achieved were very strong."

He cited the support of literally thousands of people—the mission control team, the science trainers and the orbiter crew trainers and the families who face daunting challenges and sacrifices behind crew members who are in a very demanding business.

Pilot Scott Altman seconded Searfoss in thanking those who had made the mission possible—including the Neurolab team, the training team, the rest of the crew and his understanding and supportive family. One of five crewmembers on their first space flight, he said he would never forget the first look out the window at the bright blue band of the Earth's atmosphere. "I felt very honored to be put in that place."

Mission Specialist Dave Williams said the cutting-edge science of Neurolab helps prepare for participation in the International Space Station. "It's going to be a really exciting era." The Canadian astronaut, who opened with brief greetings in English, French and Welsh, thanked those at the Canadian Space Agency in preparing him for the mission.

Kay Hire said it was an honor to

be a member not only of the crew but of the entire team. "The Neurolab mission has pushed forward the edge of science in space much further than we've ever been before," the mission specialist said. Much of the credit for the success of the lengthy mission goes to those in the welcoming crowd and to many other not able to be there, she added.

After thanking those at the ceremony for being there, Mission Specialist Rick Linnehan singled out the principal investigators for special thanks. He said they are true heroes for pushing the frontiers of medical science and research for the benefit of society. Neurolab was basic research. "We hope to use this information to build on what we've already learned and to improve the quality of human life on the planet. That's what NASA's about."

Payload Specialist Jim Pawelczyk said the experience of space flight and the experience of the Neurolab mission goes beyond words. Some crew members had trained for as long as two years. "It's been amazing to me to watch the process of bringing together so many of the faces we see here, so many of the faces at the other NASA centers," in this one defining moment, this mission, he said. He urged people at the ceremony to look around at those faces, "because it's really all of you that made this mission happen. We acted as your 'hands' in accomplishing the flight's scientific objectives."

"It was great flying on your mission," said Payload Specialist Jay Buckley. "This was a tremendous team effort, and in a way I think you all were there with us." He said that every time crew members took a piece of equipment from a locker, "we'd see the people who worked on it—people who'd made it, people who'd shown us how to use it, people who stowed it in that location." It was a tremendous group of people who made Neurolab happen, Buckley said.

He added that looking out a Columbia window at the Earth below, "you remember not to get jaded about space flight.... This is an amazing capability that we have." It's important, he said, to appreciate that we can do it, "that we've been able to work together to make it happen."

In conclusion, Abbey termed the mission historic. He said the interaction of the crew with the ground and the way the whole science program worked on Neurolab set an example for the way the agency and its partners around the world need to work together on the International Space Station. □



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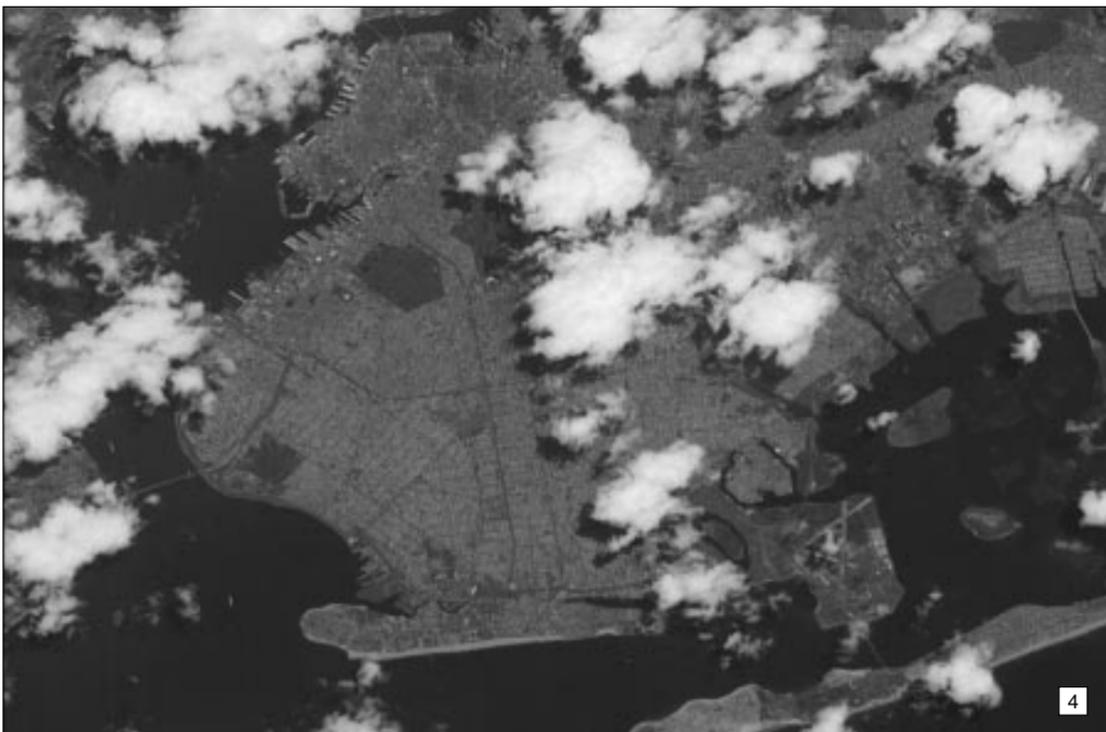
2

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3

S90e5155



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S90e5265



5

S90e5215

Selected Cities

The 39-degree inclination of the STS-90 mission gave Commander Rick Searfoss and the orbiter crew excellent opportunities to photograph U.S. cities from the flight deck while research continued in the Spacelab. Just a few of the Earth-observation sites were:

- 1 Houston, Texas
- 2 Miami, Florida
- 3 Epcot Center, Florida
- 4 The Bronx, New York City
- 5 Provo, Utah
- 6 San Francisco, California
- 7 New Orleans, Louisiana
- 8 Atlanta, Georgia
- 9 Cleveland, Ohio
- 10 Las Vegas, Nevada
- 11 Los Angeles, California



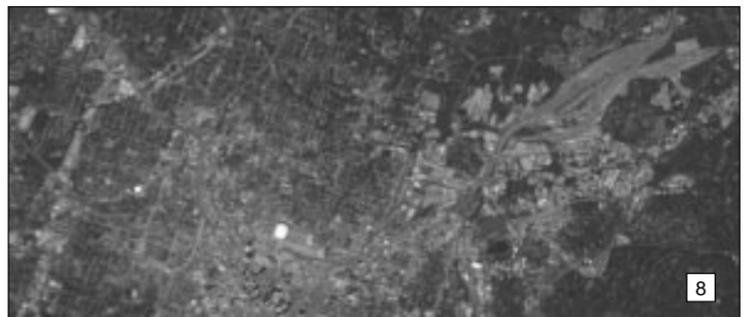
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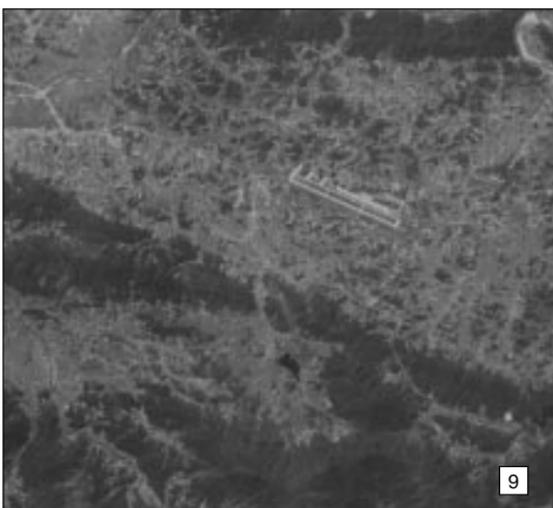
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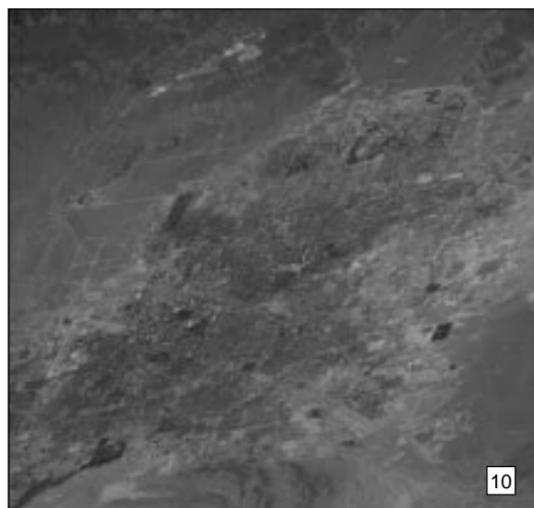
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22 Years Ago at JSC

Orbiter insulation tiles pass 100 re-entry heat chamber tests

Reprinted from the May 21, 1976, issue of the Space News Roundup.

Materials which are planned for use as part of the space shuttle orbiter heat protection armor were recently subjected to the pressures and 2,300 degree heat of 100 re-entries with no damage, according to thermal specialists at JSC.

The shuttle orbiter, which is designed for reuse up to 100 times without major refurbishment, will have four separate light-weight, reusable heat-resistant materials affixed to the exterior of the 122-foot long space plane. The thermal protection system which will provide heat management as the vehicle speeds into orbit and returns to Earth, consists of coated reinforced carbon-carbon for nose cap and wing leading edges where temperatures exceed 2,300 degrees; high temperature reusable surface insulation for areas where maximum surface temperatures which reach 700-1,200 degrees and flexible reusable surface insulation, 3 by 4 sheets of Nomex fiber, for areas which will not exceed 700 degrees F.

The HRSI tests completed one week ago at JSC, began in early April, and were supplied by the Lockheed Missiles and Space Co., Sunnyvale, Calif., which has the responsibility for developing the orbiter thermal protection system. The test centered on the high temperature insulation materials which were coated with a new glass mixture developed by thermal specialists at Ames Research Center.

The insulation tiles were placed beneath a graphite heater in a test chamber in a thermal laboratory of JSC's Engineering and Development Directorate. Nine high temperature tiles

were used in the test.

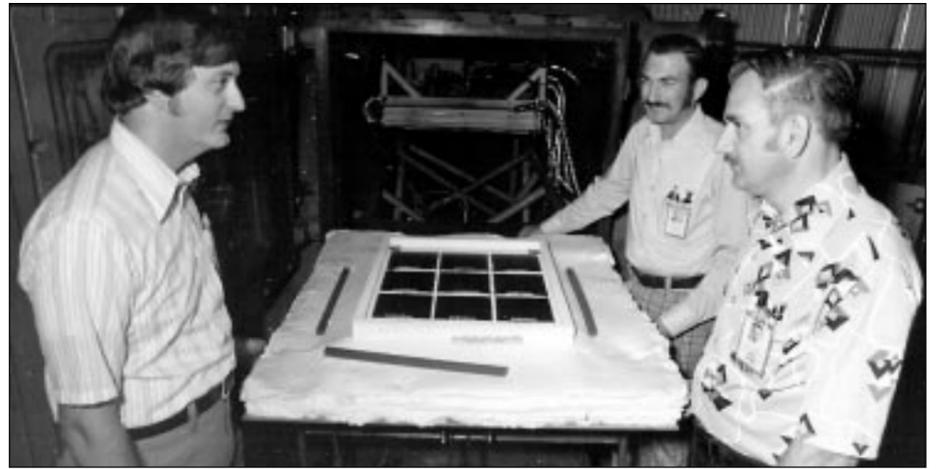
Each tile, nominally 6 by 6 inches, was sprayed with the glass mixture (silicon tetroboride additive with bora silicate glass) and then placed in the chamber and exposed to re-entry temperatures of 2,300 degrees F. Pressure inside the chamber also was regulated to duplicate the variable pressures the orbiter will undergo during the re-entry phase of the shuttle mission which begins at 400,000 feet altitude. The maximum re-entry heat is experienced when the orbiter reaches 200,000 feet altitude and is traveling at 12,000 miles per hour.

The test sequence, which lasted up to 30 minutes, was repeated during the month-long program to duplicate the 100 missions the orbiter will execute before refurbishment and maintenance of the thermal protection system will be necessary. This is the first time that the high temperature tiles have gone beyond 60 test cycles in NASA thermal test facilities without showing some signs of degradation.

At the end of the 100th test and after inspection of the tiles, Robert Dotts, subsystem manager of the reusable surface insulation system for JSC, said, "We now have a system (the tiles plus the new glass coating) which can fly 100 missions. We have a lot of confidence in the new development."

The high temperature tiles nominally vary in thickness from three-quarters of an inch to three inches. Approximately 25,000 of these tiles will be bonded to the orbiter's aluminum exterior. They will cover portions of the upper and lower fuselage, or about 5,000 square feet of the vehicle's surface.

The HRSI is made of a low density, high



NASA Photo S-76-24749

NASA and Lockheed thermal engineers look over high temperature reusable insulation for the space shuttle orbiter which recently underwent heat and pressure tests simulating 100 re-entry cycles. The test was designed to test a new glass coating which was baked onto the reusable tiles. From left are Robert Stuckey, subsystem manager for the reusable insulation of the Structures and Mechanics Division; O.J. Clevinger, Northrop Services test engineer; and Donald J. Tillian, of the Thermal Protection Branch of the Structures and Mechanics Division. The nine test tiles are shown in front of the JSC test chamber.

purity silica (glass) fiber with a silica binder. The new coating, reaction cured glass which is formed by mixing silicon tetroboride with borosilicate glass, is mixed with alcohol and sprayed on the tiles and then heated in an oven to a temperature of 2,200 degrees F. This results in a black waterproof glassy covering capable of withstanding the 2,300 degree heat of re-entry.

The reaction-cured glass was developed by an Ames research team headed by Howard Goldstein. This coating was introduced into the LMSC, Sunnyvale tile production facility in late 1975. LMSC fabricated the tiles and submitted them to JSC for the month-long test program.

More than 50 percent of the shuttle orbiter is covered with the low temperature reusable sur-

face insulation. Approximately 7,000 of these tiles, nominally 8 by 8 inches square, will be applied to the upper wing and side fuselage. They are the same material as the high temperature tile except for the differences in coating and optical pigment used to obtain solar absorptance and high emittance.

The reinforced carbon-carbon insulation covers those parts of the orbiter which will experience the highest heat load (in excess of 2,300 degrees F) and it covers about 500 square feet, along the nose and leading edge of the wings.

Altogether the insulation materials weigh approximately 20,000 lbs. The orbiter, which is 122 feet in length, weighs, without fuel and payload, 150,000 lbs. at liftoff.



EVA Project Office Manager Greg Harbaugh presents the "Team EVA" trophy, a space suit helmet over a softball, to Glenn Lutz, coach of this year's Team EVA Softball Challenge champions from the Engineering Directorate's Crew and Thermal Systems Division.

Team EVA shares fun at Gilruth in extracurricular softball tourney

Pulling off successful space walks and making them look easy is not the only thing that the JSC EVA community is good at—a few of them know how to play softball, too.

Four teams representing the Mission Operations Directorate, EVA Project Office, the Safety, Reliability and Quality Assurance Office's Safety and Mission Assurance Division and Engineering's Crew and Thermal Systems Division got together on May 2 at the Gilruth Center and competed in the second annual Team EVA Softball Challenge.

The event, an idea from the EVA Project Office, grew by an additional team this year, with S&MA joining the mix. The tournament allows these close-knit groups to get together and have some fun with, and at the expense of each other, and is a great team building experience, said participant Glenn Lutz.

Competition for the traveling trophy was evident, but all the participants had plenty to laugh and talk about at the office the next week. Scores were kept and a champion was crowned but the real winner was the EVA community, which used the opportunity to further develop its team spirit as it prepares for the assembly and maintenance of the International Space Station.

This year's champions were from the Crew and Thermal Systems Division. The team was comprised of Joey Marmolejo, Joe Nowetner, Bill Lilly, Bruce Sauser, Joe Settles, Ketan "K.C." Chhipwadia, Craig Donnellan, Lee Willis, Jason Poffenberger, Steve Poulos, Mike Lawson, Matt Davis, Hiep Nguyen, Michael Nguyen, David Hower, and Coach Glenn Lutz.

Members of the S&MA team, which placed fourth, playing under the

managerial skills of Hayden Krueger were Scott Stevens, Chuck Franca, Katie Allen, Elizabeth and Steve Conner, David and Kelly Rodrigues, Rod Toler, Cuong Nguyen, and Amie Tavanese.

The MOD team included Coach Paul Boehm, Terry Neal, Kerri Knotts, Gary Flynt, Anna Jarvis, Sean Dougherty, Arne Aamodt, Ed Tom, Phillip Fox, Scott Bleisath, Colin Anglin, Alan Groskreutz, Daryl Hemmingway, and Michelle Hollinger.

The EVA Project Office, last year's champs, placed second this year, represented by Coach Al Morey, Dave Adlis, Irene Bibyk, Larry Gana, George Gurgis, Greg Harbaugh, Robbie LaBrier, Mike Mankin, Greg Smith, Robert Yowell and John Russo.

All of the teams offered thanks to Calvin Schomburg and Sean Clardy who umpired the games at the Gilruth Center.

Gilruth Center News

Nutrition intervention program: Six-week program includes lectures, a private consultation with the dietitian and blood analysis to chart your progress. For more information call Tammie at x32980.

Defensive driving: One-day course is offered once a month at the Gilruth Center. Pre-registration required. Cost is \$25. Call for next available class.

Stamp club: Meets at 7 p.m. every second and fourth Monday in Rm. 216.

Weight safety: Required course for employees wishing to use the Gilruth weight room. The next classes are scheduled for at 8 p.m. May 28 (must be on time to receive credit for class). Pre-registration is required. Cost is \$5. Annual weight room use fee is \$90. Additional family members are \$50.

Exercise: Low-impact class meets from 5:15-6:15 p.m. Mondays and Wednesdays. Cost is \$24 for eight weeks.

Aikido: Introductory martial arts class meets from 5:15-6:15 p.m. Tuesday and Wednesday. New classes begin the first of each month. Instruction is by a fourth-degree black belt. Learn to defend yourself and get a great aerobic workout. Cost is \$35 per month.

Step/bench aerobics: Low impact cardiovascular workout. Classes meet from 5:15-6:15 p.m. Monday, Tuesdays and Thursdays. Cost is \$32 for eight weeks. For more information, call Kristen at x36891.

Yoga: Stretching Class. Low impact exercises expertly designed for people of all ages and abilities in a Westernized format 5-6 p.m. Thursdays. Cost is \$32 for eight weeks.

Ballroom dancing: Beginning and advanced students meet from 7-10 p.m. Thursdays. Cost is \$60 per couple.

Country and western dancing: Beginner class meets 7-8:30 p.m. Monday. Advanced class (must know basic steps to all dances) meets 8:30-10 p.m. Monday. Cost is \$20 per couple.

Ticket Window

Bldg. 3 Exchange Store hours are 7 a.m.-4 p.m. Monday-Friday.
Bldg. 11 Exchange Store hours are 9 a.m.-3 p.m. Monday-Friday.
For more information, please call x35350.

The following discount tickets are available at the Exchange Stores:

General Cinema Theaters	.....	\$ 5.50
Sony Loew's Theaters	.....	\$ 5.00
AMC Theaters	.....	\$ 4.75
Astroworld Early Bird Tickets (valid thru 5/31)	.....	\$18.50
Astroworld One Day Admission	.....	\$24.25
(valid at all Texas Six Flags Theme Parks)		
Astroworld Season Pass	.....	\$57.75
(valid at all Texas Six Flags Theme Parks and Water World)		
Moody Gardens (2 of 6 events)	.....	\$ 9.75
Sea World	.....adult \$27.25 ... child (3-11)	\$18.25
Schiltebahn	.....adult \$20.75 ... child (3-11)	\$17.50
Space Center Houston	.....adult \$10.25 ... child (4-11)	\$ 7.00

Metro Tokens and value cards available.

Coming Soon: Splashtown Water Park and Houston Comets Tickets.

Employees' children earn NASA scholarships

The children of five NASA employees will receive scholarships to attend the colleges of their choice from the NASA College Scholarship Fund.

The fund's board of directors, chaired by JSC's Harvey Hartman, met on May 8 to select the five recipients of the 1998-1999 \$8,000 grants.

This year's winners are Katie Lynn Davis, daughter of Daniel J.

and Susan W. Davis who work at the Marshall Space Flight Center; Joseph M. Comberiate, son of Goddard Space Flight Center employee Anthony B. Comberiate; Joyce Won-Kai Yue, daughter of Langley Research Center employee Glenn K. Yue; Jennifer Autumn Stuckey, daughter of NASA Headquarters employee Ronald K. Stuckey; and Saurabh Bansal, son

of Lewis Research Center employee (and brother of previous scholarship winner Gaurav Bansal), Narottam P. Bansal.

This brings the total number of recipients to 78 and 41 of these have graduated.

The NASA College Scholarship Fund Inc., board has determined that six scholarships will be awarded next year. Each scholarship will be

renewable annually for a maximum of \$8,000 over six calendar years.

The scholarship fund was established to award scholarships agency-wide to qualified dependents of NASA and former NASA employees. The fund was established as a direct result of a substantial unsolicited gift by the noted Pulitzer Prize winning author, James A. Michener. Many NASA employees have contributed to the

fund directly or through the Combined Federal Campaign. Other major contributors include the Freedom Forum (to honor the Hubble crew members in 1994 and again in 1997 to honor Shannon Lucid) and the JSC Chapter of the NASA Alumni League.

Further information about the Scholarship Fund may be obtained from Mary O'Connell at x35774 or Teresa Sullivan at x31034.

People on the Move

Human Resources reports the following personnel changes as of May 9, 1998:

Key Management Assignments

Jan Davis was selected as manager, Headquarters International Space Station Independent Assessment Office (located at JSC).

Bruce Hilty was selected as the deputy division chief, Operations Technology Division, Mission Operations Directorate.

Sue Rainwater was selected as chief, Mechanical Booster, Maintenance, and Crew Systems Branch, Systems Division, Mission Operations Directorate.

Mike Fodroci was selected as chief, International Elements and Operations Assurance Branch, Space Station Division, Safety, Reliability, and Quality Assurance Office.

Dane Russo was selected as assistant branch chief, Medical Operations, Medical Sciences Division, Space and Life Sciences Directorate.

Additions to the Workforce

Melissa Owens joins the Launch Package Managers Office in the International Space Station Program Office as a launch package engineer.

Linda Watters-Garcia joins the Vehicle Office in the International Space Station Program Office as a secretary.

Richard Von Wolff joins the Engineering Office at the White Sands Test Facility as an electrical engineer.

Promotions

Bridget Broussard-Guidry was selected as a financial management specialist in the Office of the Chief Financial Officer.

Anita Lile was selected as a financial management specialist in the Office of the Chief Financial Officer.

Bitsey Mendez was selected as a financial management specialist in the Office of the Chief Financial Officer.

Stephanie Castillo was selected as a computer specialist in the Program Integration Office in the Space and Life Sciences Directorate.

Reassignments Between Directorates

Tom Kwiatkowski moves from the International Space Station Program Office to the Flight Crew Operations Directorate.

Pandora Spoth-Vickery moves from the Business Management Directorate to the Engineering Directorate.

Karen Schmidt moves from the Public Affairs Office to the Center Operations Directorate.

Kathy Kaminski moves from the EVA Project Office to the Space Shuttle Program Office.

Reassignments to Other Centers

Raul Mejia of the Technology Transfer and Commercialization Office moves to Langley Research Center.

Resignations

Nanci Olson of the Engineering Directorate.

Retirements

Dick Thorson of the Information Systems Directorate.



Photo by Bill Foster
Lead Flight Director Al Pennington, center, presents the STS-90 plaque to Stephen Koerner, left, and Victor Badillo.

Carbon dioxide scrubber repair nets two teams plaque honors

The In Flight Maintenance and Electrical, Environmental, Consumables Manager teams shared the honors of hanging the STS-90 plaque in Mission Control.

Lead Flight Director Al Pennington bestowed the honor on the two teams for their "creative work" in developing a procedure to recover the Regenerative Carbon Dioxide Removal System, used to scrub excess carbon dioxide from the shuttle's atmosphere.

Working together, the IFM team, which helps develop and test all in-flight maintenance work, and the EECOM team, responsible for passive and active thermal control of the vehicle, cabin atmosphere control, avionics cooling, supply/waste water system management, and fire detec-

tion and suppression, designed a repair using aluminum tape to block a non-essential line in the RCRS system. This allowed the system to be reactivated and the mission to continue for its full duration.

"I am immensely pleased to see the number of younger faces in the members of this flight control team and note that the standards of excellence that we take for granted in MOD have not been lost but instead grow stronger in our personnel," Pennington said.

In addition to its work on the RCRS restoration, the EECOM team was recognized for its "outstanding work and exceptional persistence" in solving the Flash Evaporator System and clogged waste dump line problems on the Neurolab mission.

NASA Alumni League's local chapter elects new JSC officers

The JSC Chapter of the NASA Alumni League has selected its new officers for the 1998 year.

Chet Vaughan will serve as president, while Norm Chaffee will serve

as vice-president. Harold Benson will be secretary and Lonnie Jenkins membership chairman.

The NAL is open to all previous employees of NASA. Those inter-

ested information about the NAL may contact Chaffee at Norman.H.Chaffee1@jsc.nasa.gov or Vaughan at Chester.Vaughan@SW.boeing.com

Dates & Data

May 25

Memorial Day: Most JSC offices will be closed May 25 in observance of the Memorial Day Holiday.

May 26

Space Medicine Rounds: NASA Flight Surgeon Christopher Flynn will discuss "Human Performance in Long-Duration Space Flight: How Much Does Behavioral Medicine Matter?" for the University of Texas Medical Branch's Space Medicine Grand Rounds at 8:30 a.m. May 26 at the Center for Advanced Space Studies, 3600 Bay Area Blvd. For details, call Kay Nute 244-2019.

May 27

NMA meets: The JSC chapter of the National Management Association will host a breakfast meeting at 7 a.m. May 27 in the Nassau Bay Hilton Marina ballroom. Sylvan Rodriguez, veteran Houston journalist and KHOU-TV anchor, will discuss "The Changing Face of TV News." A spotlight speaker from the JSC Public Affairs Office also is planned. NMA members may attend for free; guest cost is \$7. For details,

contact Liz Fountain at x35257.

Spaceland Toastmasters meet: The Spaceland Toastmasters will meet at 7 a.m. May 27 at the House of Prayer Lutheran Church. For details, call George Salazar at x30162.

Communicators meet: The Clear Lake Communicators will meet at 11:30 a.m. May 27. For details contact Henry Duke at 280-4403 or Melissa Sommers at 332-0698.

Spaceteam Toastmasters meet: The Spaceteam Toastmasters will meet at 11:30 a.m. May 27 at United Space Alliance, 600 Gemini. For details, call Chuck Kubricht at 282-3908 or Brian Collins at x35190.

Astronomy seminar: The JSC Astronomy Seminar will meet at noon May 27 in Bldg. 31, Rm. 129. An open discussion meeting is planned. For more information, call Al Jackson at x35037.

May 28

Radio Club meets: The JSC Amateur Radio Club will meet at 6:30 p.m. May 28 at the Piccadilly, 2465 Bay Area Blvd. For details, call Larry Dietrich at x39198.

June 2

Launch break: STS-91 is scheduled to launch at 5:09 p.m., and all employees are encouraged to take a "launch break" to watch the action. A primary location for observing the launch will be Teague Auditorium, where the countdown and ascent will be shown on the large screen. A speaker from the Flight Director Office will provide in-person commentary during the launch and respond to questions afterward. For the first time, additional technical shots used for analysis by the mission evaluation room at Kennedy Space Center will be projected on a second screen, and a separate audio feed from the launch pad will be heard. For schedule updates, call the Employee Information Service at x36765.

June 3

Spaceland Toastmasters meet: The Spaceland Toastmasters will meet at 7 a.m. June 3 at the House of Prayer Lutheran Church. For more information, call George Salazar at x30162.

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June 4

Warning System Test: The site-wide Employee Warning System will perform its monthly audio test at noon June 4. For more information, call Bob Gaffney at x34249.

Airplane club meets: The MSC Radio Control Airplane Club meets at 7 p.m. June 4 at the Clear Lake Park building. For more information, call Bill Langdoc at x35970.

NCMA meets: The National Contract Management Association will meet at 11:30 a.m. June 4 at

the Clear Lake Golf Club. For details, call Nancy Liounis at x31865.

June 9

Aero club meets: The Bay Area Aero Club will meet at 7 p.m. June 9 at the Houston Gulf Airport clubhouse at 2750 FM 1266 in League City. For more information, call Larry Hendrickson at x32050.

NPMA meets: The National Property Management Association will meet at 5 p.m. June 9 at Robinette and Doyle Caterers, 216 Kirby in Seabrook. Dinner costs \$14. For details call Sina Hawsey at x36582.

June 10

PSI meets: The Clear Lake/NASA Chapter of Professional Secretaries International will meet at 5:30 p.m. June 10. For more information, call Elaine Kemp at x30556.

June 11

MAES meets: The Society of Mexican American Engineers and Scientists will meet at 5 p.m. June 11 at Mario's Pizza in Webster. For details, call Gerard Valle at x38835.

NASA Briefs

Astronomers see black hole feeding

Astronomers have obtained an unprecedented look at the nearest example of galactic cannibalism—a massive black hole hidden at the center of a nearby giant galaxy that is feeding on a smaller galaxy in a spectacular collision. Such fireworks were common in the early universe, as galaxies formed and evolved, but are rare today. Although the cause-and-effect relationships are not yet clear, the views provided by complementary images from two instruments aboard NASA's Hubble Space Telescope are giving astronomers new insights into the powerful forces being exerted in this complex maelstrom. Researchers believe these forces may even have shifted the axis of the massive black hole from its expected orientation.

Aerogel test may work for spacecraft

A new concept for spacecraft tiles also can be used on Earth to make efficient, vacuum-like insulation for refrigerators, furnaces and automobile catalytic converters. The new material is similar to that used for the tiles on the space shuttle to protect the vehicle from the heat generated during re-entry into Earth's atmosphere. However, the new tiles have a layer of aerogel, or "solid smoke," mixed into the tile's air spaces. Aerogel is made of silica, alumina and carbon and other materials, and can weigh less than the same volume of air. The fibers that form the tiles are mostly a mixture of silica and alumina oxides. The aerogel space-tile material could be used in commercial products that require mechanically tough super-insulation, such as catalytic converters for cars or specialty refrigeration units. In addition, the new material could be used for furnaces; liquefied gas transport trucks; or liquid carbon dioxide, nitrogen and oxygen containers.

First lady, Goldin connect with France

Using the Internet, First Lady Hillary Rodham Clinton and students at the Ecole Nationale de Chimie, Physique et Biologie in Paris recently talked to NASA Administrator Daniel S. Goldin and students at Kramer Middle School in Washington, D.C. Students shared groundwater and vegetation data collected using the CERES satellite and lead each other on tours of their respective cities. NASA and the French space agency are forging an international educational program that capitalizes on the excitement of space exploration.

JSC becomes first ISO-9001 NASA center

(Continued from Page 1)

Three internal audits and center-wide ISO 9001 training were conducted that fall. NQA first audited JSC in November 1997, and identified only one major non-conforming area. The NQA reviewed the JSC corrective action processes in February when the center successfully passed all audit requirements. As part of ISO 9001 certification, the NQA will audit the JSC Quality System in the future to ensure continued compliance and management improvements.

While many industrial companies seek ISO certification to meet business or customer demands, JSC expects the quality process to increase effective use of its resources, said Lee Norbraten, director of JSC's ISO 9000 Office.

Open season begins for Thrift Savings Plan

"Open season" for the Thrift Savings Plan began May 15 and will continue through July 31, allowing eligible employees to join, add to their retirement investments or change the allotments to the various funds.

During the period, employees will be able to begin contributing to the Thrift Savings Plan, change the amount of their contributions, changing the allocation of their contributions among the C, F, or G investment funds, or stop their current contributions.

The investment choices that

employees make during open season will apply to all new contributions, including contributions made through payroll deduction; agency automatic 1 percent contribution for Federal Employee Retirement System employees; and the agency matching contribution for FERS employees. FERS employees not making contributions, may still elect to invest all or part of their agency automatic 1 percent contribution in any of the investment funds.

Employees may sign up, make changes, or stop contributions by completing a TSP election form and

returning to AH6/ Employee Services; accessing the Employee Express web site through the Human Resources Home Page <http://hro.jsc.nasa.gov/>; or calling Employee Express at 1-800-571-3453.

Only one change per open season is permitted and it must be done by July 31. The effective date for an election or change to an election depends upon when changes are submitted.

Changes received May 15-July 4 will be effective July 5; changes received July 5-July 18 will be effective July 19; and changes received

July 19-July 31 will be effective Aug. 2.

Employees who wish to move previous TSP investments between the C, F, or G funds, don't have to wait for an open season. They may move funds 12 times each year either by mailing a TSP-30 form to the Thrift Board or by calling the 24 hour-a-day TSP "ThriftLine" directly at 504-255-8777. Those who call to make changes will need their TSP personal identification number.

For additional information, visit Employee Services in Bldg. 45, Rm. 140, or call x32681.



JSC PHOTO BY STEVE CANDLER
CINCO DE MAYO—Claudia Pena and Jose Sada perform a dance titled "La Negra" during a performance by the Mixteco Ballet Folklorico at the Bldg. 3 cafeteria during JSC's Cinco de Mayo Celebration. The dance is from the State of Jalisco, Mexico. Sada is the founder of the Houston-based dance troupe.

Seafood success leads to additional cafeteria pilots

Kabobs, stirfry, spinach fettuccini to be joined by specialty dessert selections

The success of Tuesday specials such as chicken and shrimp kabobs in JSC's Bldg. 3 cafeteria has prompted the JSC Exchange to continue the pilot indefinitely in Bldg. 3.

In addition to continuing the Tuesday Specials that were test marketed, the cafeterias will be giving away a gas grill to a lucky patron on July 1, and begin test marketing premium desserts in June.

"I'm delighted that the Tuesday Specials Pilot will be extended indefinitely in Building 3," said Harry Conran, the JSC cafeteria manager. "Based on the last six weeks of sales, we clearly have three seafood winners: chicken and shrimp kabobs, the JSC stirfry, and the seafood combo on spinach fettuccini."

"The Exchange management team appreciates the center's support to our new initiatives," added Karl Schuler, JSC Exchange Operations Manager. "In response,

I asked the cafeterias for their ideas about a summer give-away that would spark our patrons' interest. So we're going to give away a gas grill as a thank you."

During the month of June, customers will receive a ticket with the purchase of the lunch special or an equal or greater amount at the Bldg. 3 and 11 cafeterias. Customers will put their names on the tickets and drop them "in a hat." A name will be drawn on June 30, and the grill will be given away on July 1—just in time for the Fourth of July weekend with a couple of days to spare for assembly.

In addition to the gas grill give-away, the cafeterias are investigating the possibility of offering premium desserts. "Currently we're looking for a couple of leading candidates that will have broad appeal," Conran said, "such as a nice New York cheese cake and perhaps a carrot cake. We'll also be experimenting with other new entrees in the near future as well."

National quality awards go to two JSC contractors

(Continued from Page 1)

Services Corp., Lanham, Md., both received the award in the large business, service category. ILC Dover, Inc., Frederica, Del., received the award in the large business, product category. In the small business, product category BST Systems Inc., Plainfield, Conn., received the award; and Advanced Technology Co., Pasadena, Calif., received the award in the small business, service category.

Dyncorp supports JSC's fleet of 45 aircraft, which fly more than 14,000 hours a year in support of NASA activities. In its nomination, JSC reported that the contractor was responsible for cost avoidance savings of \$21 million, 49,000 flights without incident, seven con-

secutive award fee "excellent ratings," 182 consecutive months without a union grievance, a one-third reduction in aircraft spares costs and a 99.98 percent mission effectiveness in its operation of the T-38 astronaut training aircraft fleet.

"DynCorp brought a new spirit of teamwork to our aircraft operations," said Flight Crew Operations Director Dave Leestma. "We work well together and have a common goal—the safe and efficient operation of our aircraft fleet. They have done a superb job and are well-deserving of the George M. Low award."

ILC received its honors both for its work in supporting human space walks, and for its recent success in the development and delivery of

the Mars Pathfinder airbag landing system.

"ILC's commitment to quality is evident every time we perform a successful space walk," said JSC Engineering Director Leonard Nicholson. "The fact that we expect to complete the same amount of space-walking time in the next five years as we have throughout the entire U.S. space flight history to date reflects our confidence in quality-conscious suppliers such as ILC."

Allied Signal Technical Services Corp. demonstrated exemplary operational proficiency of over 99.996 percent from 1995 through 1997 with 99.94 percent systems reliability covering the same time frame.

"Each of these companies has

definitely made a positive impact on NASA's performance goals," said Frederick Gregory, associate administrator for Safety and mission assurance at NASA Headquarters.

BST achieves consistently outstanding performance in a field often characterized as "black magic"—aerospace batteries. BST developed the battery for the Mars Pathfinder. The battery lasted more than three times the planned Mars surface-mission duration, 98 Martian days versus the required 30 days.

Advanced Technology Co. is considered a world-class metal joining company, tackling jobs that most organizations consider impossible. The company has produced 20 imaging detectors that are operating error-free in space.

Two companies earn top small contractor award

(Continued from Page 1)

Integration Support to the International Space Station. Barrios is responsible for developing and sustaining an electronic information system to provide ISS users with access to technical and management program data. Tasks included database development, applications development, systems operations and technical planning.

Barrios employs 300 people providing information technology, space operations, training, and configuration/change management services to NASA, the Department of Defense, and the contractor community, as well as the commercial sector.

Johnson Engineering Corp. was selected for the company's outstanding effort in providing Flight Crew Systems support to multiple pro-

grams, including the Space Shuttle Program and the Space Station Program.

The Johnson Engineering prime contract includes design, development, and fabrication of mockups and trainers used for astronaut training in the Mockup and Integration Laboratory at JSC and in the Neutral Buoyancy Laboratory at the Sonny Carter Training Facility. Other Johnson Engineering responsibilities include facility operations and sustaining engineering in the MAIL and the NBL; the development and provisioning of flight crew equipment; crew station stowage design and payload integration, human systems engineering; and configuration management support.

Johnson Engineering has been a JSC contractor since 1974, starting

with a habitability study for Skylab, which led to involvement and support for stowage design and payload integration on every manned mission since the first flight of the shuttle in 1978.

The Government Procurement Connection has evolved into a collaborative effort between local, state, and federal government entities. This unique event marks an exciting new day in inter-governmental cooperation and information accessibility regarding government contracting opportunities. Guests speakers at the luncheon included Houston Mayor Lee Brown, Master of Ceremonies Bill Balleza, News Anchor from Channel 2, and keynote speaker Dr. Julian Earls, Lewis Research Center deputy director for operations.



The Roundup is an official publication of the National Aeronautics and Space Administration, Lyndon B. Johnson Space Center, Houston, Texas, and is published every other Friday by the Public Affairs Office for all space center employees. Deadline for the submission of articles is Friday, three weeks before the desired date of publication.

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